Message

From: Brennan, Amanda [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BRENNAN, AMANDA]
Sent: 1/26/2022 5:52:06 PM
To: Boyce, Matthew [Boyce.Matthew@epa.gov]; Chao, Alex [chao.alex@epa.gov]
Subject: RE: soil degradation proposal question

Thanks, Alex and Matt!

So with the intra-batch normalization, nothing different would have to be done with the analytical sample processing portion as long as the same tracers are spiked at the same concentration in all samples? It would all be done in the sample processing portion?

Great idea about using the transect data to minimize features for temporal changes.

I did ask for transect and temporal sampling in my proposal. As you said Alex, it would be great to provide evidence that AltEn is in fact the potential source, and maybe speak towards transport of contaminants as well. Since they are already doing the transect work (I believe), hopefully, it would be easy to collect a bit more soil and split for NTA work.

I'm not sure if I explicitly asked, but would you both be contributors to this research? I'm sure you have many other projects being proposed, but I imagine it would be a small portion of an FTE (0.5?) . I am planning on doing most of work, but will definitely need your experience and valuable input on design and sample processing. You've already helped tremendously with the sample collection portion.

Thanks,
Amanda

From: Boyce, Matthew <Boyce.Matthew@epa.gov>
Sent: Wednesday, January 26, 2022 12:18 PM
To: Chao, Alex <chao.alex@epa.gov>; Brennan, Amanda <brennan.amanda@epa.gov>
Subject: RE: soil degradation proposal question

I think Alex covered the main consideration of using Tracers to minimize variation between batches.

From our conversation yesterday, I know we talked about collecting spatially distant samples and you were concerned about potential washout. I think it would offer another level of control by allowing you to remove any features that are not significantly different between the two locations (this may also help remove features that occur from timing of sample collection but are not related the contaminants). From there, you could compare those significant features between the time points for a second layer of comparison to see what is temporally changing.

-Matt

From: Chao, Alex <chao.alex@epa.gov>
Sent: Wednesday, January 26, 2022 11:18 AM
To: Brennan, Amanda <brennan.amanda@epa.gov>; Boyce, Matthew <Boyce.Matthew@epa.gov>
Subject: RE: soil degradation proposal question

Hi Amanda,

You're absolutely right that there is going to be variability at the different timepoints not necessarily due to actual differences in the samples. What we have typically done to mitigate this intra-batch variability is to do some sort of

batch correction using our tracers that are spiked into all samples/batches at the same concentration prior to analysis. Based on the observed abundances of those tracer compounds in each batch, we make an adjustment on the abundance values on every batch that normalizes for differences in matrix effects/instrument sensitivity/etc. So to answer your question, yes I think you can get some meaningful information from sampling at different timepoints, but you definitely want to do some sort of intra-batch normalization because of the batch effects described.

This is an unrelated comment, but I think in addition to timepoint sampling, I think it would be potentially interesting to sample soil radially outwards from the AltEn site. If the goal is to find xenobiotics linked to the AltEn facility, presumably you could make an assumption that those that decrease in intensity as you get further away have the AltEn facility as a source. Just a thought!

Alex

From: Brennan, Amanda <brennan.amanda@epa.gov>
Sent: Wednesday, January 26, 2022 9:59 AM
To: Boyce, Matthew <Boyce.Matthew@epa.gov>; Chao, Alex <chao.alex@epa.gov>
Subject: soil degradation proposal question

Hi Matt & Alex,

From an NTA perspective, what are the general thoughts about comparing results/trends from samples that are collected and analyzed months apart? For example, if I were to analyze a soil sample taken today, and then analyze another sample taken at the same location say 90 days later. I know it's necessary to do the instrumental analysis on the same samples within hours. I know there is going to be a lot of environmental variability between the sample from day 1 to day 90. So, maybe making any conclusions about trends in increases or decreases in parent pesticides won't be apparent, but taking into consideration this variability, does this seem reasonable or unlikely to yield anything of interest?

Thanks,
Amanda

Amanda Brennan, PhD
Research Chemist
Advanced Analytical Chemistry Methods Branch
US EPA/CCTE/CCED
Research Triangle Park, NC
brennan.amanda@epa.gov
919-541-2323